

What is claimed is:

1. A method of driving a semiconductor display device comprising a plurality of pixels, each containing a pixel TFT and a pixel electrode; an opposing electrode; and a liquid crystal formed between the plurality of pixel electrodes and the opposing electrode;

wherein display signals are inputted to the plurality of pixel electrodes through the plurality of pixel TFTs,

wherein the display signals inputted to the plurality of pixel electrodes have positive or negative polarity, with the electric potential of the opposing electrode as a standard, and

wherein the pixel electrodes into which display signals having the positive polarity are inputted, and the pixel electrodes into which display signals having the negative polarity are inputted differ every frame period.

2. A method of driving a semiconductor display device comprising a plurality of pixels, each containing a pixel TFT and a pixel electrode; a plurality of source signal lines; a plurality of gate signal lines; an opposing electrode; and a liquid crystal formed between the plurality of pixel electrodes and the opposing electrode;

wherein switching of the plurality of pixel TFTs is controlled in accordance with a selection signal inputted to the plurality of gate signal lines,

wherein display signals inputted to the plurality of source signal lines are inputted to the plurality of pixel electrodes through the plurality of pixel TFTs,

wherein the display signals inputted to the plurality of pixel electrodes have positive or negative polarity, with the electric potential of the opposing electrode as a standard, and

wherein the pixel electrodes into which display signals having the positive polarity are inputted, and the pixel electrodes into which display signals having the negative polarity are inputted differ every frame period.

3. A method of driving a semiconductor display device comprising a plurality of pixels, each containing a pixel TFT and a pixel electrode; a plurality of source signal lines; a plurality of gate signal lines; an opposing electrode; and a liquid crystal formed between the plurality of pixel electrodes and the opposing electrode;

wherein switching of the plurality of pixel TFTs is controlled in accordance with a selection signal inputted to the plurality of gate signal lines,

wherein display signals inputted to the plurality of source signal lines are inputted to the plurality of pixel electrodes through the plurality of pixel TFTs,

wherein the display signals inputted to the plurality of pixel electrodes have positive or negative polarity, with the electric potential of the opposing electrode as a standard,

wherein the display signals inputted to each of the plurality of source signal lines always have the same polarity, with the electric potential of the opposing electrode taken as a standard, within each frame period, and

wherein the pixel electrodes into which display signals having the positive polarity are inputted, and the pixel electrodes into which display signals having the negative polarity are inputted differ every frame period.

4. A method of driving a semiconductor display device comprising a plurality of pixels, each containing a pixel TFT and a pixel electrode; a plurality of source signal lines; a plurality of gate signal lines; an opposing electrode; and a liquid crystal formed between the plurality of pixel electrodes and the opposing electrode;

wherein switching of the plurality of pixel TFTs is controlled in accordance with a selection signal inputted to the plurality of gate signal lines,

wherein display signals inputted to the plurality of source signal lines are inputted to the plurality of pixel electrodes through the plurality of pixel TFTs,

wherein the display signals inputted to the plurality of pixel electrodes have positive

or negative polarity, with the electric potential of the opposing electrode as a standard,

wherein the polarity of all of the display signals inputted to the plurality of source signal lines is the same polarity, with the electric potential of the opposing electrode taken as a standard, within one line period, and

wherein the pixel electrodes into which display signals having the positive polarity are inputted, and the pixel electrodes into which display signals having the negative polarity are inputted differ every frame period.

5. A method of driving a semiconductor display device according to any of claims 1 to 4, wherein pixel electrodes to which the display signals having positive polarity are inputted, and pixel electrodes to which the display signals having negative polarity are inputted may differ randomly every frame period.

6. A method of driving a semiconductor display device according to any of claims 1 to 4, wherein the polarity of the display signals inputted to all of the pixel electrodes may be inverted in two adjacent frame periods.

7. A semiconductor display device comprising:

- a source signal line driver circuit;
- a gate signal line driver circuit;
- a plurality of source signal lines;
- a plurality of gate signal lines;
- a pixel portion; and
- a display signal generation portion,

wherein the pixel portion has a plurality of pixels, each containing a pixel TFT and a pixel electrode,

wherein the display signal generation portion has: a control portion; a polarity data signal generation portion; an alternating current signal generation portion; a display signal selection portion; a + side display signal generation portion; and a - side display signal generation portion,

wherein the control portion controls driving of the polarity data signal generation portion, the alternating current signal generation portion, the source signal line driver circuit, and the gate signal line driver circuit,

wherein the polarity data signal generation portion inputs a polarity data signal having polarity data to the alternating current signal generation portion,

wherein the alternating current signal generation portion generates an alternating current signal in accordance with the polarity data signal and inputs the alternating current signal to the display signal selection portion,

wherein an image signal having positive polarity and an image signal having negative polarity are generated in the + side display signal generation portion and the - side display signal generation portion, respectively, and are inputted to the display signal selection portion,

wherein display signals are generated in the display signal selection portion from the image signal having positive polarity, the image signal having negative polarity, and the alternating current signal, and are inputted to the source signal line driver circuit,

wherein the display signals inputted to the source signal line driver circuit are sampled and inputted to the plurality of source signal lines,

wherein switching of the plurality of pixel TFTs is controlled in accordance with a selection signal inputted to the plurality of gate signal lines,

wherein the display signals inputted to the plurality of source signal lines are inputted to the plurality of pixel electrodes through the plurality of pixel TFTs,

wherein the display signals inputted to the plurality of pixel electrodes have positive or negative polarities, with the electric potential of the opposing electrode taken as a standard, and

wherein the pixel electrodes to which the display signals having positive polarity

are inputted, and the pixel electrodes to which the display signals having negative polarity are inputted differ every frame period.

8. A semiconductor display device comprising:

a source signal line driver circuit;

a gate signal line driver circuit;

a plurality of source signal lines;

a plurality of gate signal lines;

a pixel portion;

a gray-scale voltage control portion; and

a gray-scale voltage power source;

wherein the source signal line driver circuit has a D/A converter circuit,

wherein the pixel portion has a plurality of pixels, each containing a pixel TFT and a pixel electrode,

wherein the gray-scale voltage control portion has a control portion, a polarity data signal generation portion, and an alternating current signal generation portion,

wherein the control portion controls driving of the polarity data signal generation portion, the alternating current signal generation portion, the source signal line driver circuit, and the gate signal line driver circuit,

wherein the polarity data signal generation portion inputs a polarity data signal having polarity data to the alternating current signal generation portion,

wherein the alternating current signal generation portion generates an alternating current signal in accordance with the polarity data signal and inputs the alternating current signal to the gray-scale voltage power source,

wherein a gray-scale voltage inputted to the D/A converter circuit from the gray-scale voltage power source is controlled in accordance with the alternating current signal,

wherein display signals outputted from the D/A converter circuit are sampled and inputted to the plurality of source signal lines,

wherein switching of the plurality of pixel TFTs is controlled in accordance with a selection signal inputted to the plurality of gate signal lines,

wherein the display signals inputted to the plurality of source signal lines are inputted to the plurality of pixel electrodes through the plurality of pixel TFTs,

wherein the display signals inputted to the plurality of pixel electrodes have positive or negative polarities, with the electric potential of the opposing electrode taken as a standard, and

wherein the pixel electrodes to which the display signals having positive polarity are inputted, and the pixel electrodes to which the display signals having negative polarity are inputted differ every frame period.

9. A semiconductor display device comprising:

a source signal line driver circuit;

a gate signal line driver circuit;

a plurality of source signal lines;

a plurality of gate signal lines;

a pixel portion; and

a display signal generation portion;

wherein the pixel portion has a plurality of pixels, each containing a pixel TFT and a pixel electrode,

wherein the display signal generation portion has: a control portion; an address counter; a polarity data signal generation portion; a memory; an alternating current signal generation portion; a display signal selection portion; a + side display signal generation portion; and a - side display signal generation portion,

wherein the control portion controls driving of the address counter, the alternating

current signal generation portion, the source signal line driver circuit, and the gate signal line driver circuit,

wherein an address of the memory is specified in accordance with a counter signal outputted from the address counter,

wherein the polarity data signal generation portion inputs polarity data stored in the address to the alternating current signal generation portion as a polarity data signal,

wherein the alternating current signal generation portion generates an alternating current signal in accordance with the polarity data signal and inputs the alternating current signal to the display signal selection portion,

wherein an image signal having positive polarity and an image signal having negative polarity are generated in the + side display signal generation portion and the - side display signal generation portion, respectively, and are input to the display signal selection portion,

wherein display signals are generated in the display signal selection portion from the image signal having positive polarity, the image signal having negative polarity, and the alternating current signal, and are inputted to the source signal line driver circuit,

wherein the display signals inputted to the source signal line driver circuit are sampled and inputted to the plurality of source signal lines,

wherein switching of the plurality of pixel TFTs is controlled in accordance with a selection signal inputted to the plurality of gate signal lines,

wherein the display signals inputted to the plurality of source signal lines are inputted to the plurality of pixel electrodes through the plurality of pixel TFTs,

wherein the display signals inputted to the plurality of pixel electrodes have positive or negative polarities, with the electric potential of the opposing electrode taken as a standard, and

wherein the pixel electrodes to which the display signals having positive polarity are inputted, and the pixel electrodes to which the display signals having negative polarity are inputted differ every frame period.

10. A semiconductor display device comprising:
- a source signal line driver circuit;
  - a gate signal line driver circuit;
  - a plurality of source signal lines;
  - a plurality of gate signal lines;
  - a pixel portion;
  - a gray-scale voltage control portion; and
  - a gray-scale voltage power source;
- wherein the source signal line driver circuit has a D/A converter circuit,
- wherein the pixel portion has a plurality of pixels, each containing a pixel TFT and a pixel electrode,
- wherein the gray-scale voltage control portion has a control portion, an address counter, a polarity data signal generation portion, a memory, and an alternating current signal generation portion,
- wherein the control portion controls driving of the address counter, the alternating current signal generation portion, the source signal line driver circuit, and the gate signal line driver circuit,
- wherein an address of the memory is specified in accordance with a counter signal outputted from the address counter,
- wherein the polarity data signal generation portion inputs polarity data stored in the address to the alternating current signal generation portion as a polarity data signal,
- wherein the alternating current signal generation portion generates an alternating current signal in accordance with the polarity data signal and inputs the alternating current signal to the gray-scale voltage power source,
- wherein a gray-scale voltage inputted to the D/A converter circuit from the gray-scale voltage power source is controlled in accordance with the alternating current signal,



wherein display signals outputted from the D/A converter circuit are sampled and inputted to the plurality of source signal lines,

wherein switching of the plurality of pixel TFTs is controlled in accordance with a selection signal inputted to the plurality of gate signal lines,

wherein the display signals inputted to the plurality of source signal lines are inputted to the plurality of pixel electrodes through the plurality of pixel TFTs,

wherein the display signals inputted to the plurality of pixel electrodes have positive or negative polarities, with the electric potential of the opposing electrode taken as a standard, and

wherein the pixel electrodes to which the display signals having positive polarity are inputted, and the pixel electrodes to which the display signals having negative polarity are inputted differ every frame period.

11. A semiconductor display device according to any of claims 7 to 10, the polarity data is information regarding the polarity of the display signals inputted to all of the pixels.

12. A method of driving a semiconductor display device comprising a plurality of pixels, each containing a pixel TFT and a pixel electrode; a plurality of source signal lines; a plurality of gate signal lines; an opposing electrode; and a liquid crystal formed between the plurality of pixel electrodes and the opposing electrode;

wherein switching of the plurality of pixel TFTs is controlled in accordance with a selection signal inputted to the plurality of gate signal lines,

wherein display signals inputted to the plurality of source signal lines are inputted to the plurality of pixel electrodes through the plurality of pixel TFTs,

wherein the display signals inputted to the plurality of pixel electrodes have positive or negative polarity, with the electric potential of the opposing electrode as a standard,

wherein display signals having the positive polarity are inputted to some of the

plurality of the pixel electrodes, and display signals having the negative polarity are inputted to the other of the plurality of pixel electrodes in first one frame period, and

wherein only some of the plurality of the pixel electrodes have the inverse polarity in second one frame period.

13. A semiconductor display device comprising:

a source signal line driver circuit;

a gate signal line driver circuit;

a plurality of source signal lines;

a plurality of gate signal lines;

a pixel portion; and

a display signal generation portion,

wherein the pixel portion has a plurality of pixels, each containing a pixel TFT and a pixel electrode,

wherein the display signal generation portion has: a control portion; a polarity data signal generation portion; an alternating current signal generation portion; a display signal selection portion; a + side display signal generation portion; and a - side display signal generation portion,

wherein the control portion controls driving of the polarity data signal generation portion, the alternating current signal generation portion, the source signal line driver circuit, and the gate signal line driver circuit,

wherein the polarity data signal generation portion inputs a polarity data signal having polarity data to the alternating current signal generation portion,

wherein the alternating current signal generation portion generates an alternating current signal in accordance with the polarity data signal and inputs the alternating current signal to the display signal selection portion,

wherein an image signal having positive polarity and an image signal having

negative polarity are generated in the + side display signal generation portion and the - side display signal generation portion, respectively, and are inputted to the display signal selection portion,

wherein display signals are generated in the display signal selection portion from the image signal having positive polarity, the image signal having negative polarity, and the alternating current signal, and are inputted to the source signal line driver circuit,

wherein the display signals inputted to the source signal line driver circuit are sampled and inputted to the plurality of source signal lines,

wherein switching of the plurality of pixel TFTs is controlled in accordance with a selection signal inputted to the plurality of gate signal lines,

wherein the display signals inputted to the plurality of source signal lines are inputted to the plurality of pixel electrodes through the plurality of pixel TFTs,

wherein the display signals inputted to the plurality of pixel electrodes have positive or negative polarities, with the electric potential of the opposing electrode taken as a standard,

wherein display signals having the positive polarity are inputted to some of the plurality of the pixel electrodes, and display signals having the negative polarity are inputted to the other of the plurality of pixel electrodes in first one frame period, and

wherein only some of the plurality of the pixel electrodes have the inverse polarity in second one frame period.

14. A semiconductor display device comprising:

- a source signal line driver circuit;
- a gate signal line driver circuit;
- a plurality of source signal lines;
- a plurality of gate signal lines;
- a pixel portion;
- a gray-scale voltage control portion; and

a gray-scale voltage power source;  
wherein the source signal line driver circuit has a D/A converter circuit,  
wherein the pixel portion has a plurality of pixels, each containing a pixel TFT and  
a pixel electrode,

wherein the gray-scale voltage control portion has a control portion, a polarity data  
signal generation portion, and an alternating current signal generation portion,

wherein the control portion controls driving of the polarity data signal generation  
portion, the alternating current signal generation portion, the source signal line driver circuit, and the  
gate signal line driver circuit,

wherein the polarity data signal generation portion inputs a polarity data signal  
having polarity data to the alternating current signal generation portion,

wherein the alternating current signal generation portion generates an alternating  
current signal in accordance with the polarity data signal and inputs the alternating current signal to  
the gray-scale voltage power source,

wherein a gray-scale voltage inputted to the D/A converter circuit from the gray-  
scale voltage power source is controlled in accordance with the alternating current signal,

wherein display signals outputted from the D/A converter circuit are sampled and  
inputted to the plurality of source signal lines,

wherein switching of the plurality of pixel TFTs is controlled in accordance with  
a selection signal inputted to the plurality of gate signal lines,

wherein the display signals inputted to the plurality of source signal lines are  
inputted to the plurality of pixel electrodes through the plurality of pixel TFTs,

wherein the display signals inputted to the plurality of pixel electrodes have positive  
or negative polarities, with the electric potential of the opposing electrode taken as a standard,

wherein display signals having the positive polarity are inputted to some of the  
plurality of the pixel electrodes, and display signals having the negative polarity are inputted to the

other of the plurality of pixel electrodes in first one frame period, and

wherein only some of the plurality of the pixel electrodes have the inverse polarity in second one frame period.